

**PATENT APPLICATION**

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

In re application of

Docket No: Q79580

Toru TSUKADA, et al.

Appln. No.: 10/763,186

Group Art Unit: 3682

Confirmation No.: 6504

Examiner: Chong Hwa KIM

Filed: January 26, 2004

For: FEED SCREW DEVICE

**RESPONSE TO NOTICE OF NON-COMPLIANT APPEAL BRIEF  
UNDER 37 C.F.R. § 41.37**

**MAIL STOP APPEAL BRIEF - PATENTS**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

Appellant submits herewith an entire Appeal Brief in response to the *Notification of Noncompliant Reply Brief* dated August 8, 2007. The Appeal Brief adjusts the spacing on page 16 to address the issue raised by the Examiner in the *Notification of Noncompliant Reply Brief*.

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**I. REAL PARTY IN INTEREST**

The real party of interest is NSK Ltd. (Assignee) by virtue of an assignment executed by the Inventors, on June 12, 1997, and recorded by the Assignment Branch of the U.S. Patent and Trademark Office in parent Application No. 08/877,518 (now U.S. Patent No. 6,338,285) on reel/frame 8615/0838.

## **II. RELATED APPEALS AND INTERFERENCES**

Upon information and belief, there are no other prior or pending appeals, interferences, or judicial proceedings known to Appellants, Appellants' representative or the Assignee that may be related to, be directly by, or have a bearing on the Board's decision in this appeal.

### **III. STATUS OF CLAIMS**

Claims 1-16 are canceled. Claims 17-47 are rejected (*see* final Office Action dated July 25, 2006). Claims 17-47 are the claims on appeal (*see* Appendix).

**IV. STATUS OF AMENDMENTS**

No amendments were made to the pending claims after the issuance of the final Office  
Action dated July 25, 2006.

**V. SUMMARY OF THE CLAIMED SUBJECT MATTER**

An exemplary embodiment of the present invention is drawn to a feed screw device that provides lubricant to a screw shaft. Prior feed screw devices have suffered from configurations that are large in size (page 3, lines 8-9); do not provide proper lubrication (page 3, 15-21); and which result in displacement of parts and premature wear (page 3, line 22-page 4, line 6).

The features disclosed in the present specification provide a novel and unobvious configuration that addresses problems in the prior art. Independent claims 17, 18, 19, 20 and 31-34 will be described in regard to the exemplary embodiment of Figures 12 and 13, which were elected in response to the Election/Restriction requirement dated August 9, 2004. However, it is noted that certain features of Figures 12 and 13 are shared with other embodiments, as noted in the specification, and reference may be made to these other embodiments when describing portions of the invention.

As shown in Figures 12 and 13, a feed screw device is provided having a screw shaft 1 (page 21, lines 18-22; and page 29, lines 15-25). A nut member 2 threadably engages an outer peripheral surface of the screw shaft 1 (*Id.*). A lubricant supply device or member 6 is provided that contacts the screw shaft 1 (page 29, lines 22-25). A housing member or retaining ring 9 is secured to the nut member 2 and houses the lubricant supply device 6 (page 30, lines 3 and 4). The housing member or retaining ring 9 includes a side that extends radially inward to cover an axial end portion of the lubricant supply device, the axial end portion of the lubricant supply device faces in the longitudinal direction away from the nut member (Figures 12 and 13). As shown in Figures 12 and 13, the side of the housing member or retaining ring 9, having the screw

holes 16, extends radially inward to cover an axial end portion of the lubricant supply device 6. As also shown in Figures 12 and 13, the axial end portion of lubricant supply device (e.g., flat end face of 6 having openings 7) faces in the longitudinal direction away from the nut member 2.

Claim 36 recites a feed screw device having a screw shaft 1 (page 21, lines 18-22; and page 29, lines 15-25). A nut member 2 threadably engages an outer peripheral surface of the screw shaft 1 (*Id.*). Means for supplying a lubricant to the screw shaft 6 is provided to contact the screw shaft 1 (page 29, lines 22-25). Means for storing 9 is secured to the nut member 2 and houses the means for supplying the lubricant 6 (page 30, lines 3 and 4). The means for storing 9 includes a side that extends radially inward to cover an axial end portion of the means for supplying the lubricant, and the axial end portion of the means for supplying the lubricant faces in the longitudinal direction away from the nut member (Figures 12 and 13). As shown in Figures 12 and 13, the side of the means for storing 9, having the screw holes 16, extends radially inward to cover an axial end portion of the means for supplying the lubricant 6. As also shown in Figures 12 and 13, the axial end portion of the means for supplying the lubricant (e.g., flat end face of 6 having openings 7) faces in the longitudinal direction away from the nut member 2.

The above-noted explanations are provided merely to assist the reader in understanding aspects of the independent claims with regard to exemplary embodiments provided in the present specification and are not intended to limit the claimed invention.

**VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL**

A) Whether claims 17-47 are obvious under 35 U.S.C. § 103(a) over Nilsson (U.S. Patent No. 3,643,521 [hereinafter “Nilsson”]) in view Chiba (JP 04046216 A [hereinafter “Chiba”]).

B) Whether claims 17-47 are obvious under 35 U.S.C. § 103(a) over Nilsson in view Yabe, et al. (U.S. Patent No. 5,678,927 [hereinafter “Yabe”]).

C) Whether claims 17-47 are obvious under 35 U.S.C. § 103(a) over Nilsson in view of Asai, et al. (U.S. Patent No. 5,501,526 [hereinafter “Asai”]).



## **VII. ARGUMENT**

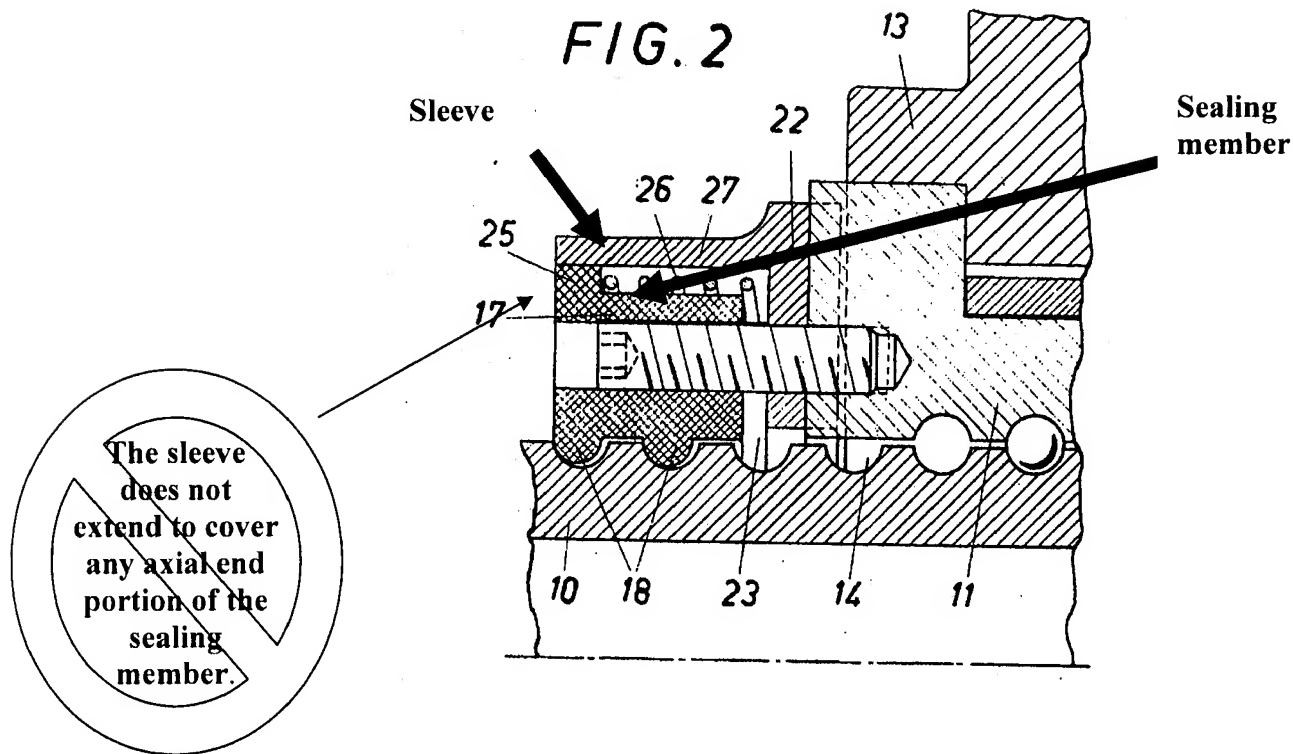
Nilsson is applied in each of the three rejections in substantially the same manner. It is acknowledged by the Examiner that Nilsson does not disclose: 1) a side that extends radially inward to cover an axial end portion of a lubricant supply device or member; or 2) a lubricant supply device that contains a lubricant oil or grease (see Office Action dated page 3, lines 9 and 10; page 5, lines 4 and 5; and page 6, lines 21 and 22).

### **I) REJECTION UNDER 35 U.S.C. § 103(A) OVER NILSSON IN VIEW CHIBA.**

#### ***CLAIMS 17-36, 46 and 47***

**A) There is no motivation to modify Nilsson with Chiba to include a side that covers an axial end of the lubricant supply device.**

Claims 17, 18, 22, 31, 32, and 34 recite a side that extends radially inward to cover an axial end portion of the lubricant supply device or member. Claims 19 and 33 recite a side portion that covers an axial end of the lubricant supply device. Claim 36 recites a side that extends radially inward to cover an axial end portion of means for storing lubricant.



It is acknowledged by the Examiner that Nilsson does not disclose a side that covers an axial end portion of the lubricant supply device. Instead, the sleeve 27 of Nilsson covers the outer periphery of the sealing member 17 and is explicitly disclosed as not extending radially inward so as to cover *any* axial end portion of the sealing member 17. There is no motivation found in the references (or the art in general) to modify the sleeve 27 to include a side that covers an axial end portion of the sealing member 17, and such a feature is actually taught away from, as discussed below.

The Board of Patent Appeals and Interferences has maintained that most, if not all inventions, arise from a combination of old elements. (*In re Kotzab*, 55 USPQ2d at 1316 (*citing In re Rouffet*, 149 F.3d 1350, 1357, 47 USPQ2d 1453, 1457 (Fed. Cir. 1998))). Thus, every

element of a claimed invention may often be found in the prior art. (*Id.*) However, identification in the prior art of each individual part claimed is insufficient to defeat patentability of the whole claimed invention. (*Id.*) Rather, to establish obviousness based on a combination of the elements disclosed in the prior art, there must be some motivation, suggestion or teaching of the desirability of making the specific combination that was made by the applicant (emphasis added). (*In re Kotzab*, 55 USPQ2d at 1316 (citing *In re Dance*, 160 F.3d 1339, 1343, 48 USPQ2d 1635, 1637 (Fed. Cir. 1998); and *In re Gordon*, 733 F.2d 900, 902, 221 USPQ 1125, 1127 (Fed. Cir. 1984))).

Chiba does not provide any motivation to modify Nilsson so that a side of the sleeve 27 extends radially inward to cover an axial end portion of the sealing member 17. Chiba is applied for disclosing a housing member 8 and 9 which houses a felt element 7 having oil. On the other hand, the sealing member 17 of Nilsson is disposed within the tubular sleeve member 27 (which the Examiner applies against the claimed housing). The Examiner acknowledges that the alleged housing 27 of Nilsson does not include a side that extends radially inward to cover an axial end portion of the sealing member 17. Instead, the housing of Nilsson is cut flush with the axial end face of the sealing member 17 to clearly avoid covering any portion of the axial end face of the sealing member 17. The sealing member 17 of Nilsson is fixedly held to the components 11 via a screw member and is acted upon by a compression spring 26.

There is clearly no reason that a skilled artisan would have modified the housing 22 to include a side that extends radially inward to cover an axial end of member 17. Nilsson does not disclose any problem with its housing that would require such an additional side. In fact, there

are clear reasons why one would not have modified Nilsson to have the claimed features. For example, if the housing of Nilsson had the claimed additional side, the sealing member 17 would be trapped within the housing 17 and could not be backed out if needed, which would hinder assembly, as well as disassembly. Moreover, material and labor costs would increase if an additional side was added to the housing. In effect, there is clearly no motivation found in Nilsson to make such a modification, nor is there motivation found in Chiba to alter Nilsson.

Moreover, the felt 7 of Chiba is disposed between the wiper 9 and the felt housing 8, so that the felt member 7 is maintained in place. As noted above, the sealing member 17 of Nilsson is maintained in place via the screw. There is absolutely no need to provide any further means to maintain the position of the sealing member 17 in Nilsson. Any further means to maintain the position of the sealing member 17 would: 1) be superfluous, 2) not provide any additional benefit not already provided in Nilsson, and 3) would hinder the assembly/disassembly of Nilsson.

The alleged motivation set forth in the Office Action is to “protect the lubricant supply device from separating from the nut member so that the feet screw device would last longer.” (See Office Action, page 3, last sentence.) It is clear upon review of both Chiba and Nilsson that the references are mutually exclusive and utilize different means for maintaining their respective elements 7 and 17. The sealing member 17 of Nilsson is not unrestrained, nor is there any indication that its screw (large screw member shown in Figure 2) does not sufficiently maintain the sealing member 17 in place.

Accordingly, Applicants respectfully submit that, for at least the many reasons noted above, there is no motivation to modify the housing of Nilsson to provide the unique combination of features, including those recited in: A) claims 17, 18, 22, 31, 32, and 34 that require a side that extends radially inward to cover an axial end portion of the lubricant supply device; B) claims 19 and 33 that require a side portion that covers an axial end of the lubricant supply device; and C) claim 36 that requires a side that extends radially inward to cover an axial end portion of the means for storing the lubricant, such that the rejection under 35 U.S.C. § 103(a) should be withdrawn.

**II) REJECTION UNDER 35 U.S.C. § 103(A) OVER NILSSON IN VIEW CHIBA.**

***CLAIMS 37-45.***

**A) There is no motivation to modify Nilsson with Chiba to include a lubricant supply device or means for storing a lubricant**

Independent claims 17, 18, 19, 22, 31, 32, 33 and 34 recite a lubricant supply device. A skilled artisan will appreciate that a lubricant supply device is a device which supplies lubricant. Claim 36 recites a means for supplying a lubricant. Dependent claims 37-45 recite that the lubricant supply device or means for supplying the lubricant contains a lubricant oil or grease.

It has long been held that the Examiner must “show reasons that the skilled artisan, confronted with the same problems as the inventor and with no knowledge of the claimed invention, would select the elements from the cited prior art references for a combination in the manner claimed.” *In re Rouffet*, 47 USPQ2d 1453 (Fed.Cir. 1998). Also, the mere fact that references can be “combined or modified does not render the resultant combination [or

modification] obvious unless the prior art also suggests the desirability of the combination [or modification].” *In re Mills*, 916 F.2d 680 (Fed.Cir. 1990); MPEP §2143.01.

The sealing member 17 of Nilsson does not “supply” any lubricant or “contain” a lubricant oil or grease. The sealing member 17 is used to maintain grease within the chamber 23, as explicitly noted in column 2, lines 14-17 of Nilsson. Basically, the sealing member 17 acts as a “safety valve” to allow grease to pass when a surplus of grease is present in the chamber 23. (*See Id.*)

Nilsson explicitly requires that its lubricant (for the shaft) comes from the grease stored in the area 23 and not the sealing member 17, which is disclosed as being made of p.t.f.e. or a similar synthetic resin having good frictional properties and a certain resiliency. (See column 1, lines 44-47 of Nilsson.) As shown in Figure 2 of Nilsson, the screw member (not labeled) extends through the seal member 17 to connect the seal member 17 to the nut 11 and, thus, would naturally need to be resilient. There is no teaching in the prior art to gratuitously modify the resilient sealing member 17 of Nilsson to be a lubricant supply device, when a “surplus” of grease is already stored in the area 23. Modifying the sealing member 17 to supply any additional lubrication is simply not needed. Further, there is no reason to modify the sealing member 17 to supply a lubricant because grease from the storage area 23 is also present between the sealing member and the shaft 10 (see Nilsson, col. 2, lines 13 and 14).

Further, Chiba does not provide any teaching or suggestion to modify Nilsson. For example, Chiba discloses that its element 7 (asserted by the Examiner to be a lubricant supply device) is an “oil coated felt,” (see abstract of Chiba). The oil-coated felt 7 of Chiba is part of a

dust protective device for avoiding invasion of foreign material or chips, and is not for supplying lubricant to the screw shaft.

Regarding the oil contained in “the oil-coated member” described in Chiba, this oil is for easily removing chips and other debris from the rail, and is *not* the lubricant. This is clear from the following description of Chiba: “chips and others dropping on the surface of the rail 1 are caught by this oil film and denatured or modified. As a result, even fine foreign materials or chips wetted by the oil and adhered to the rail 1 are easily removed (scraped) from the surface of the rail 1 by the wiper 9 sliding.” (See Chiba, page 3, left-lower column, line 15 to right-lower column, line 11.)

Further, the lubrication for “the linear guide 2” described in Chiba is performed by the grease, and not by “the oil” contained in the oil-coated member. This is clear from the following description of Chiba: “Further, even if entering, since chips and others are denatured or modified by the oil, those neither absorb the grease nor wear the ball or rail 1.” (See Chiba, page 3, right-lower column, lines 8 to 11.)

It will be appreciated that the oil-coated member 17 in Chiba does not correspond to the lubricant supply device of the independent claims. Also, there is no teaching that the oil in Chiba is even a “lubricant.” A skilled artisan will appreciate that an “oil” does not inherently teach or suggest a “lubricant.” For example, oils such as lamp oils, various light oils or animal oils could not properly serve as a lubricant for a linear guide device, even though it may trap dust, as required in Chiba. Thus, claims 37-45 are deemed patentable over Nilsson and Chiba for

at least the reasons above, in addition to there respective dependencies on claims 17, 18, 19, 22, 31, 32, 33, 34 and 36.

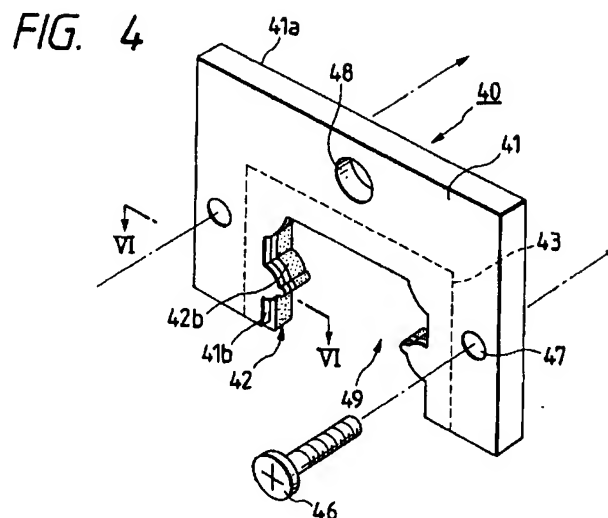
**III) REJECTION UNDER 35 U.S.C. § 103(A) OVER NILSSON IN VIEW YABE**

***CLAIMS 17-36, 46 and 47***

**A) There is no motivation to modify Nilsson with Yabe to include a side that covers an axial end of the lubricant supply device.**

The combination of Nilsson and Yabe also fails to teach or suggest the features of independent claims 17-19, 22, 31-34 and 36. Yabe is applied for allegedly disclosing a housing member 41 and an alleged lubricant supply device 42. It is clear that, based on the explicit teachings of Nilsson, there is no motivation to modify its housing 22 to include any end face that extends to cover the sealing member 17. In fact, doing so would hinder the assembly/disassembly of the device. Moreover, it is not even clear how the sandwich structure of Yabe would be applied to Figure 2 of Nilsson, as shown below in reproduced Figure 4 of Yabe.





Again, both Nilsson and Yabe teach completely different elements assembled in completely different ways. A skilled artisan provided with Figure 4 of Yabe surely would not have modified the housing 22 of Nilsson to provide the claimed features for these reasons and those mentioned above in regard to the rejection relying on Chiba, such that the rejection under 35 U.S.C. § 103(a) should be withdrawn.

**IV) REJECTION UNDER 35 U.S.C. § 103(A) OVER NILSSON IN VIEW YABE.**

**CLAIMS 37-45.**

**A) There is no motivation to modify Nilsson with Yabe to include a lubricant supply device or means for storing a lubricant**

As noted above, the sealing member 17 is used to maintain grease within the chamber 23, and acts as a “safety valve” to allow grease to pass when a surplus of grease is present in the chamber 23. (*See Id.*)

Nilsson further explicitly requires that its lubricant (for the shaft) comes from the grease stored in the area 23 and not the sealing member 17. There is no teaching in Yabe that would have motivated one to gratuitously modify the resilient sealing member 17 of Nilsson to be a lubricant supply device or member, when a “surplus” of grease is already stored in the area 23. Modifying the sealing member 17 to supply any additional lubrication is simply not needed. Further, there is no reason to modify the sealing member 17 to supply a lubricant, because grease from the storage area 23 is present between the sealing member and the shaft 10 (see Nilsson, col. 2, lines 13 and 14). Thus, claims 37-45 are deemed patentable over Nilsson and Yabe for at least the reasons above, in addition to their respective dependencies on claims 17, 18, 19, 22, 31, 32, 33, 34 and 36.

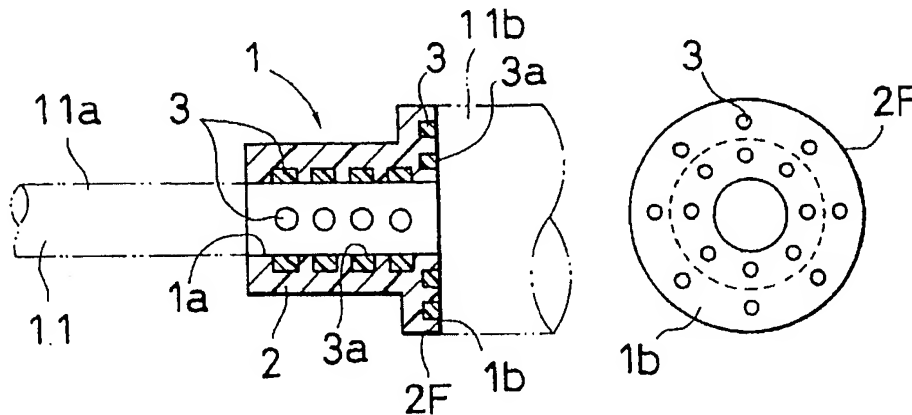
**V) REJECTION UNDER 35 U.S.C. § 103(A) OVER NILSSON IN VIEW OF ASAI.**

***CLAIMS 17-36, 46 and 47***

**A) There is no motivation to modify Nilsson with Asai to include a side that covers an axial end of the lubricant supply device.**

The combination of Nilsson and Asai also fails to teach or suggest the features of independent claims 17-19, 22, 31-34 and 36. Asai is relied on for allegedly teaching a housing member and a lubricant supply device 3. The grounds of rejection assert that the housing member includes a side 1A that extends radially inward to cover an axial end portion of the lubricant supply device, as shown below in reproduced Figures 13A and 13B of Asai.

FIG. 13(a)      FIG. 13(b)



For the reasons set forth above in regard to the rejection relying on Chiba, it should be understood that there is no motivation to provide an additional end face to the housing 22 of Nilsson. Moreover, the side of Asai that is relied on is a sliding surface (1A), as noted in column 6, lines 5-11 of Asai. A skilled artisan will appreciate that the sliding surface 1A is not a side that extends radially inward. Instead, the sliding surface 1A extends axially along the track 11. Moreover, the shaft of Nilsson includes grooved ridges. Therefore, if Nilsson were modified in accordance with Asai, the surface 1A would clearly not "slide" as required by Asai. There is no motivation to modify Nilsson with the teachings of Asai, such that the rejection under 35 U.S.C. § 103(a) should be withdrawn.

**VI) REJECTION UNDER 35 U.S.C. § 103(A) OVER NILSSON IN VIEW ASAI.**

***CLAIMS 37-45.***

**A) There is no motivation to modify Nilsson with Yabe to include a lubricant supply device or means for storing a lubricant**

As noted above, the sealing member 17 is used to *maintain* grease within the chamber 23, and is not intended to contain a lubricant oil or grease. Instead, Nilsson explicitly discloses that a “chamber 23” is provided between the sealing member 17 and the asserted nut member 11. As noted in column 2, lines 1-8 of Nilsson, the chamber 23 serves as a reservoir for grease, such that grease from the chamber 23 is spread over the bar in front of the bearings or balls 16. Thus, there is no motivation to modify the “sealing” member 17 of Nilsson to include the lubricating oil of Asai because the sealing member 17 is intended to maintain grease in the chamber 23, and not contain grease or lubricating oil itself.

Grease from the storage area 23 in Nilsson is present between the sealing member and the shaft 10 (see Nilsson, col. 2, lines 13 and 14). Thus, there is no teaching in Yabe that would have motivated one to gratuitously modify the resilient sealing member 17 of Nilsson to be a lubricant supply device, when a “surplus” of grease is already stored in the area 23. Modifying the sealing member 17 to supply any addition lubrication is simply not needed. Asai even acknowledges the problems associated with excess grease by disclosing:

“In addition, when the amount of application of the lubricant is excessive, a phenomenon of lubricant outflow occurs or the lubricating agent is expelled when the bearing slides, causing the problem of soiling around the periphery of the bearing.”

See col. 2, lines 11-15 of Asai.

Thus, modifying the sealing member 17 to supply any addition lubrication is simply not needed and is actually taught away from by Asai, such that claims 37-45 are deemed patentable over Nilsson and Asai for at least the reasons set forth above, in addition to their respective dependencies on claims 17, 18, 19, 22, 31, 32, 33, 34 and 36.

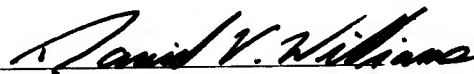
**Conclusion:**

In view of the above, Appellants respectfully request the members of the Board to reverse the rejections of the appealed claims and to find each of the claims allowable as defining subject matter that is patentable over the art of record.

Unless a check is submitted herewith for the fee required under 37 C.F.R. §41.37(a) and 1.17(c), please charge said fee to Deposit Account No. 19-4880.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,

  
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**65565**

CUSTOMER NUMBER

Date: August 29, 2007

**CLAIMS APPENDIX**

CLAIMS 17-47 ON APPEAL:

17. A feed screw device comprising:

a screw shaft;

a nut member threadably engaging an outer peripheral surface of said screw shaft;

a lubricant supply device, at least a portion of the lubricant supply device contacting said screw shaft; and

a housing member which is secured to said nut member and houses said lubricant supply device, said nut member being positioned outside of said housing member,

wherein said housing member is disposed to project from an axial end surface of the nut member and along an outer circumferential surface of the lubricant supply device, said outer circumferential surface extending in a longitudinal direction of said screw shaft, and

wherein said housing member includes a side that extends radially inward to cover an axial end portion of said lubricant supply device, said axial end portion of said lubricant supply device faces in the longitudinal direction away from said nut member.

18. A feed screw device comprising:

a screw shaft;

a nut member threadably engaging an outer peripheral surface of said screw shaft;

a lubricant supply device, at least a portion of the lubricant supply device contacting said screw shaft; and

a housing member which is secured to said nut member and houses said lubricant supply device, said nut member being positioned outside of said housing member,

wherein said housing member comprises a cylindrical portion covering an outer circumferential surface of the lubricant supply device, and said outer circumferential surface extends beyond an end face of said nut member, and

wherein said housing member includes a side that extends radially inward to cover an axial end portion of said lubricant supply device, said axial end portion of said lubricant supply device faces away from said nut member in a longitudinal direction of said screw shaft.

19. A feed screw device comprising:

a screw shaft;

a nut member threadably engaging an outer peripheral surface of said screw shaft, said nut member having an end surface that faces in a longitudinal direction of said screw shaft;

a lubricant supply device, at least a portion of the lubricant supply device contacting said screw shaft; and

a housing member which is secured to said nut member and houses said lubricant supply device, said housing member including,

a cylindrical portion that extends in a direction away from said nut member,

an end surface that faces towards said end surface of said nut member, and

a side portion opposite said end surface of said housing member, said side portion covers an axial end of said lubricant supply device, said axial end of said lubricant supply device faces away from said nut member in a longitudinal direction of said screw shaft.

20. The feed screw device of claim 19, wherein said end face covers said axial end away from the nut member.

21. The feed screw device of claim 19, wherein said portion of said lubricant supply device contacts a thread groove of said screw shaft.

22. A feed screw device comprising:

a screw shaft;

a nut member threadably engaging an outer peripheral surface of said screw shaft;

a lubricant supply device, at least a portion of the lubricant supply device contacting said screw shaft; and

a housing member which is secured to said nut member and houses said lubricant supply device,

wherein said housing member has a cylindrical portion that extends away from said nut member so as to surround said lubricant supply device, and

wherein said housing member includes a side that extends radially inward to cover an axial end portion of said lubricant supply device, said axial end portion of said lubricant supply device faces away from said nut member in a longitudinal direction of said screw shaft.

23. The feed screw device of claim 17, further comprising:

a means for securing said housing to said nut member.

24. The feed screw device of claim 18, further comprising:

a means for securing said housing to said nut member.

25. The feed screw device of claim 19, further comprising:



a means for securing said housing to said nut member.

26. The feed screw device of claim 22, further comprising:

a means for securing said housing to said nut member.

27. The feed screw device of claim 23, wherein said means for securing comprises a screw threaded to contact at least a portion of said nut member and into at least a portion of said housing.

28. The feed screw device of claim 24, wherein said means for securing comprises a screw threaded to contact at least a portion of said nut member and into at least a portion of said housing.

29. The feed screw device of claim 25, wherein said means for securing comprises a screw threaded to contact at least a portion of said nut member and into at least a portion of said housing.

30. The feed screw device of claim 26, wherein said means for securing comprises a screw threaded to contact at least a portion of said nut member and into at least a portion of said housing.

31. A feed screw device comprising:

a screw shaft;

a nut member threadably engaging an outer peripheral surface of said screw shaft;

a lubricant supply device contacting said screw shaft;

a retaining ring that stores said lubricant supply device and is fixed to said nut member, said nut member being positioned outside of said retaining ring; and

a fastener that fixes said retaining ring to said nut member,

wherein said retaining ring projects from an axial end surface of the nut member and along an outer circumferential surface of the lubricant supply device, said outer circumferential surface extending in a longitudinal direction of said screw shaft, and

wherein said retaining ring includes a side that extends radially inward to cover an axial end portion of said lubricant supply device, said axial end portion of said lubricant supply device faces away from said nut member in the longitudinal direction of said screw shaft.

32. A feed screw device comprising:

a screw shaft;

a nut member threadably engaging an outer peripheral surface of said screw shaft;

a lubricant supply device contacting said screw shaft;

a retaining ring that stores said lubricant supply device and is fixed to said nut member, said nut member being positioned outside of said retaining ring; and

a fastener that fixes said retaining ring to said nut member,

wherein said retaining ring comprises a cylindrical portion covering an outer circumferential surface of the lubricant supply device, and said outer circumferential surface extends beyond an end face of said nut member, and

wherein said retaining ring includes a side that extends radially inward to cover an axial end portion of said lubricant supply device, said axial end portion of said lubricant supply device faces away from said nut member in a longitudinal direction of said screw shaft.

33. A feed screw device comprising:

a screw shaft;

a nut member threadably engaging an outer peripheral surface of said screw shaft, said nut member having an end surface that faces in a longitudinal direction of said screw shaft;

a lubricant supply device contacting said screw shaft;

a retaining ring that stores said lubricant supply device and is fixed to said nut member, said nut member being positioned outside of said retaining ring, said retaining ring including,

a cylindrical portion that extends in a direction away from said nut member,

an end surface that faces towards said end surface of said nut member, and

a side portion opposite said end surface of said retaining ring, said side portion covers an axial end of said lubricant supply device, said axial end facing away from said nut member in a longitudinal direction of said screw shaft; and

a fastener that fixes said retaining ring to said nut member.

34. A feed screw device comprising:

a screw shaft;

a nut member threadably engaging an outer peripheral surface of said screw shaft;

a lubricant supply device contacting said screw shaft;

a retaining ring that stores said lubricant supply device and is fixed to said nut member;

and

a fastener that fixes said retaining ring to said nut member,

wherein said retaining ring has a cylindrical portion that extends away from said nut member so as to surround said lubricant supply device, and

wherein said retaining ring includes a side that extends radially inward to cover an axial end portion of said lubricant supply device, said axial end portion of said lubricant supply device faces away from said nut member in a longitudinal direction of said screw shaft.

35. The feed screw device of claim 31, wherein said fastener comprises a screw threaded to contact at least a portion of said nut member, and into at least a portion of said retaining ring.

36. A feed screw device comprising:

a screw shaft;

a nut member threadably engaging an outer peripheral surface of said screw shaft;

a means for supplying a lubricant to said screw shaft; and

a means for storing said means for supplying said lubricant outside of said nut member, said means for storing being in contact with a surface of said nut member,

wherein said means for storing extends from an axial end surface of the nut member in a longitudinal direction of said screw shaft, and

wherein said means for storing includes a side that extends radially inward to cover an axial end portion of said means for supplying a lubricant, said axial end portion of said means for supplying a lubricant faces away from said nut member in the longitudinal direction of said screw shaft.

37. The feed screw device of claim 17, wherein said lubricant supply device contains a lubricant oil or grease.

38. The feed screw device of claim 18, wherein said lubricant supply device contains a lubricant oil or grease.

39. The feed screw device of claim 19, wherein said lubricant supply device contains a lubricant oil or grease.

40. The feed screw device of claim 22, wherein said lubricant supply device contains a lubricant oil or grease.

41. The feed screw device of claim 31, wherein said lubricant supply device contains a lubricant oil or grease.

42. The feed screw device of claim 32, wherein said lubricant supply device contains a lubricant oil or grease.

43. The feed screw device of claim 33, wherein said lubricant supply device contains a lubricant oil or grease.

44. The feed screw device of claim 34, wherein said lubricant supply device contains a lubricant oil or grease.

45. The feed screw device of claim 36, wherein said means for supplying a lubricant contains a lubricant oil or grease.

46. The feed screw device of claim 19, wherein said housing member surrounds an outer circumferential surface of the lubricant supply device.

47. The feed screw device of claim 33, wherein said retaining ring surrounds an outer circumferential surface of the lubricant supply device.

**EVIDENCE APPENDIX:**

None.

**RELATED PROCEEDINGS APPENDIX**

None.